DATA LINK TEST TOOLS

Joint Interoperability Test and Evaluation

SPAWAR Systems Center, San Diego

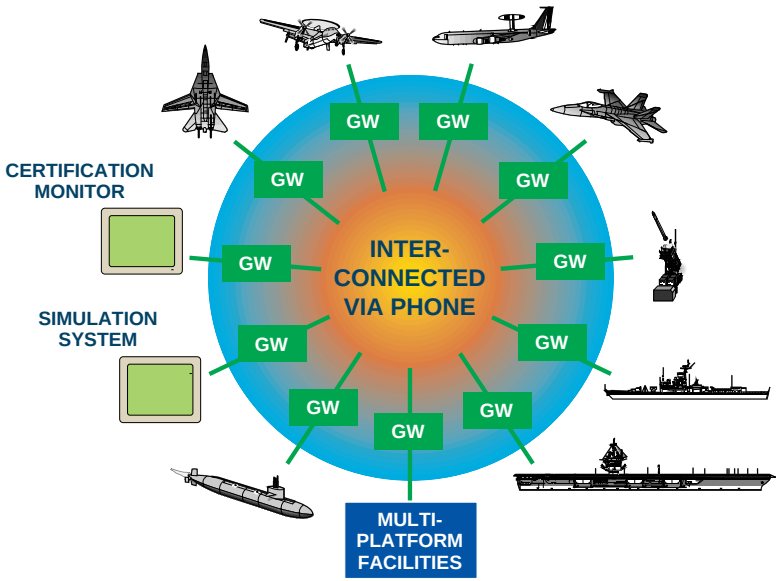
SPAWAR
Systems Center
San Diego

DATA LINK TEST TOOLS OVERVIEW

Link-16 and Link-11 tactical data link communications systems use line-of-sight radio communications. This limits interoperability testing and training to systems that are local to each other. The Data Link Test Tools extend the communications environments of test facilities by interconnecting sites, allowing a wider range of participants for testing and training. Using Data Link Test Tools, geographically separate test facilities and host combat systems can be linked together over secure phone lines. Sites anywhere in the world can be linked into one logical network for combined testing.

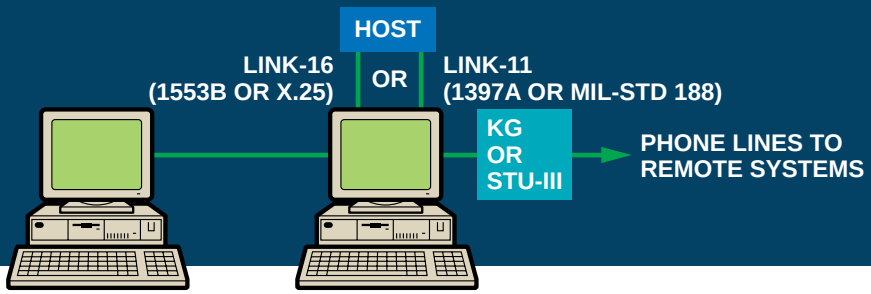
The extended testing network is accomplished by the placement of a Data Link Gateway (DLGW) system at each test site. By simulating either a link host to a JTIDS Class 2 terminal operating in a Link-16 network or emulating a JTIDS Class 2 terminal, the DLGW systems are networked over secure telephone lines, enabling a virtual Link-16 network.

DATA LINK TEST TOOLS WORLD (WORLDWIDE HOST TO HOST/COAST TO COAST)



TYPICAL DATA LINK GATEWAY CONNECTION

The picture below shows a common method for using Gateways to connect remote tactical data systems.



DATA LINK GATEWAY SYSTEM EMULATION

Currently, the Gateway can emulate the following Link-16 system types:

- **Navy Ship 2H**
- **Navy MIDS (F/A-18)**
- **USMC MCE**
- **Navy Air (E-2C and F-14D)**
- **Air Force (AWACS and F-15)**
- **Army Class 2M (Patriot, THAAD, JTAGS)**

For most of these communication system types, the Gateway can be set up to connect as a Gateway Host (GH), Gateway Terminal Emulator (GTE), Gateway Network Monitor (GNM), Gateway Virtual Host (GVH), or Gateway Virtual Terminal (GVT).

CUSTOMER SUPPORT AND TRAINING

SSC San Diego provides Data Link Test Tool engineering, custom development, installation, training, configuration management, and test support. Data Link Test Tools support the following test communities:

- **Theater Missile Defense System Exerciser (TMDSE)**
- **NATO ADSIA standard for Link-16 interoperability testing**
- **SIMPLE-compliant**
- **JITC interoperability**
- **NCTSI certification testing**

DATA LINK GATEWAY CAPABILITIES

When a Data Link Gateway (DLGW) system is connected to a Link-16 network, it adds a suite of functions that give the user the ability to monitor, control, record, analyze data, and participate in a data link exercise. The following is a list of the main functions available within a DLGW system:

- **JTIDS Network Library (JNL) Build – Allows the user to build or edit the terminal load.**
- **Geographic Tactical Situation Display (GeoSit) – Displays a real-time map display of an exercise, showing tracks and PPLIs**
- **Test Configuration – Enables the user to see what devices are connected to the network and are participating in the exercise.**
- **On-Line, Quick-Look Analysis – Displays the status of link message traffic.**
- **TADIL-J Message Readouts – Displays detailed readouts for messages as selected by the user. Readouts and printouts also are available in the DERG format.**
- **Data Extraction, Reduction and Replay – Allows the user to record a data link test exercise and save it to a file. The file can then be reduced and replayed. Post-test data reduction can be performed at each Gateway site. If remote site analysis is required, the raw extracted data or the reduced data can be quickly transferred via the Gateway connection**
- **File Transfer Protocol (FTP) and E-mail – Allows the user to transfer data files and send messages to other Gateway users across the LAN.**
- **Connectivity to Data Link Gateway Network – Data Link Gateway can be used to connect other DLGW systems operating in any of the modes (GH, GTE, GNM, GVH/GVT).**

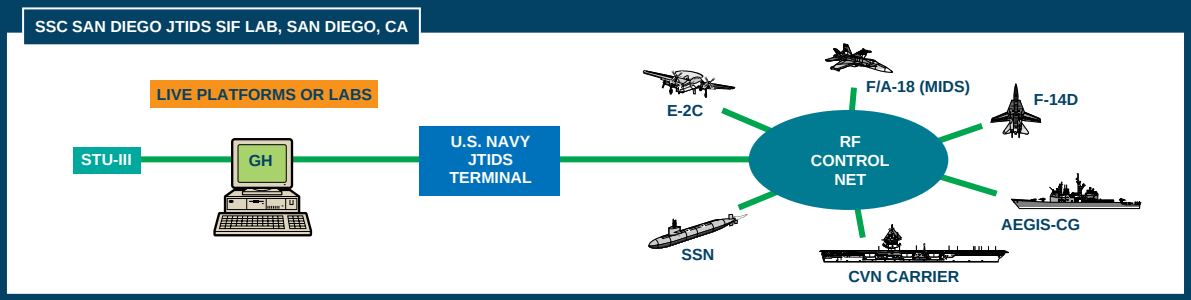
CONNECTIVITY EXAMPLES

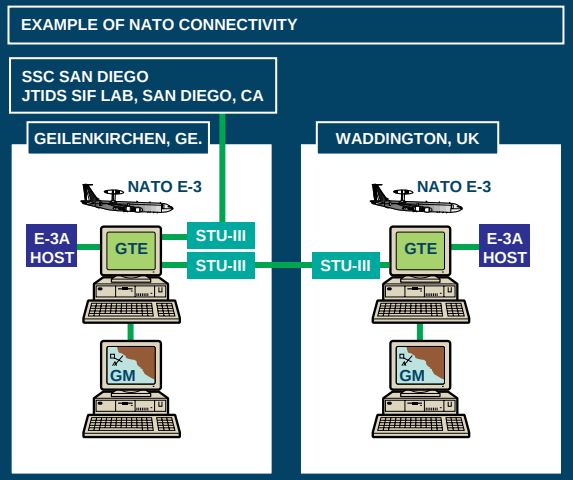
Data Link Gateway (DLGW) provides for TADIL connectivity using COTS via the DLGW, thereby simplifying requirements for hardware (JTIDS terminals) and RF connectivity Line of Sight (LOS). Ease of use and accessibility to all users enhance early training and develop user confidence in TADIL interoperability.

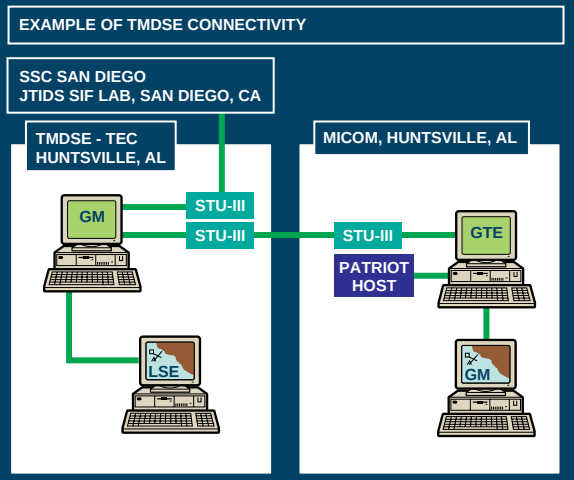
Data Link Gateway also reduces the expense of previously required collocation of test units to conduct interoperability testing and assessment.

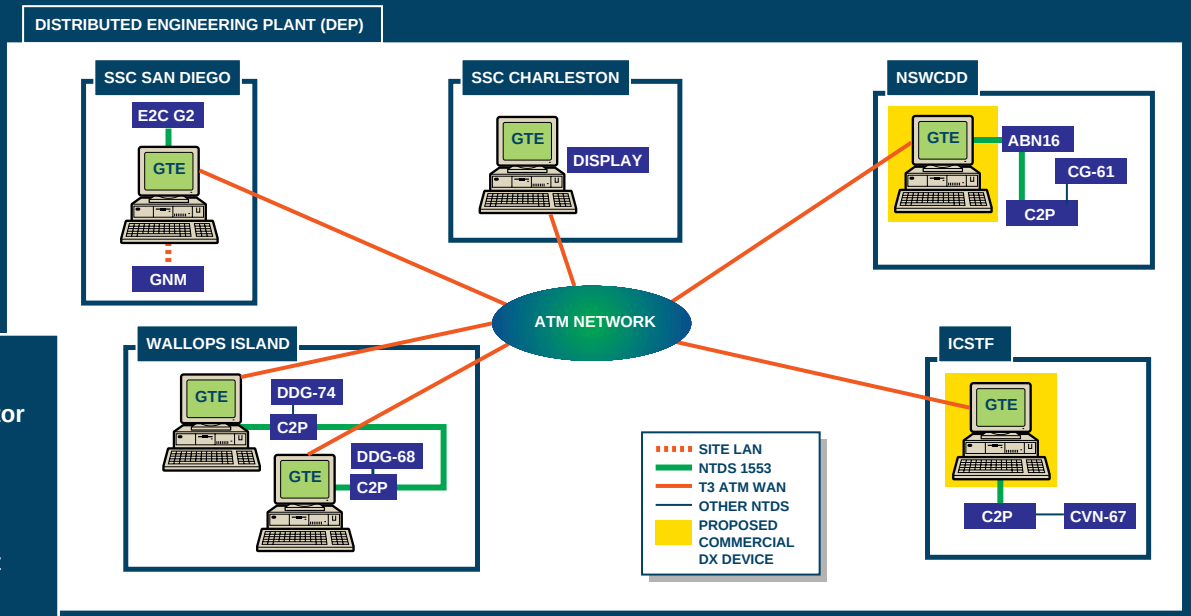
Data Link Gateway's capability to interface through different communications methods allows for flexibility for establishing DLGW communications.

Data Link Gateway is fielded in operational and T&E environments, and is certified by U.S. test agencies (JITC, NCTSI).









GATEWAY FAMILY

GTE: Gateway Terminal Emulator
GH: Gateway Host
GM: Gateway Monitor
LSE: Link-16 Engine
GW/L-11: Gateway Link-11 Test Network

DATA LINK TEST TOOLS

Gateway Host (GH) – Acts as a host to a JTIDS/Class 2 terminal participating in a JTIDS RFN. Allows additional remote systems to participate in remote JTIDS networks via remote Gateway nodes.

Gateway Terminal Emulator (GTE) – Emulates a Link-16 terminal. Communicates with Link-16 host and also connects to other Gateways to pass Link-16 data.

Gateway Network Monitor (GNM) – Connects to a Data Link Gateway network and monitors the data flow. Invisible to Link-16 hosts.

Gateway Virtual Host/Virtual Terminal (GVH/GVT) – Always used as a pair, the GVH/GVT Gateway systems operate between a Link-16 host and terminal, allowing them to be remote from each other. The GVT connects to the Link-16 host, and the GVH connects to the Link-16 terminal, then the Link-16 host and terminal data are passed between the GVH and the GVT.

Gateway Link-11 (GDE) – These are Gateway's Link-11 emulating systems, such as the GDE (Gateway Data Terminal Set Emulator). These systems allow Link-11 hosts to connect to other Gateways to pass Link-11 data.

Link-16 Engine (LSE) – Works as a Link-16 translator, allowing other non-Link-16 devices to connect to a Gateway network and provides the capability to inject Link-16 messages.

TADIL-J Host Simulator (TJHS) – Emulates a Link-16 host, much as the GH, but with the additional capabilities of adding tracks and performing other actual host functions of which the GH is not capable.

Additional Data Link Test Tools Available

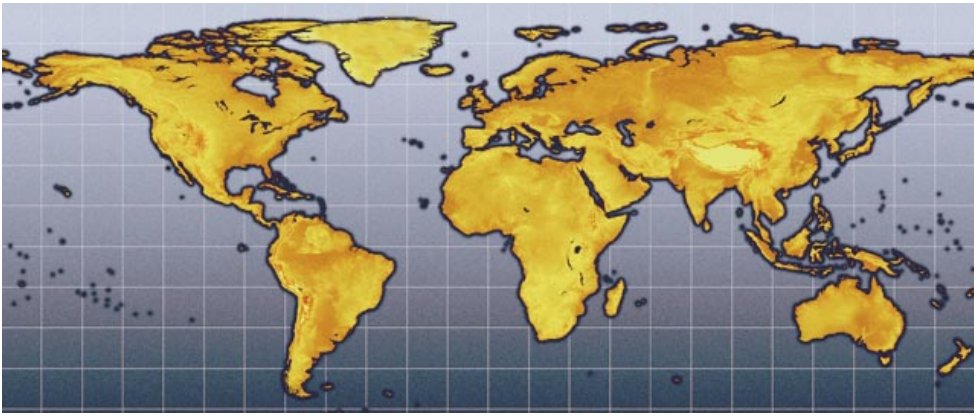
Script Generator – Stand-alone offline utility unit that creates test scripts. These scripts pass events to Link-16 networks and between different Data Link Test Tools.

Script Controller – Executes test scripts on the SSC San Diego Systems Integration Facility (SIF) Script Network.

Simulation Interface Unit – Interface unit that allows remote simulation systems to connect to the SIF Script Network DLGW capabilities.

DART – A data analysis and reduction tool.

GATEWAY SITES



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AWACS Support

Pt. Mugu
Tinker AFB
AEGIS
THAAD
PMRF, HI
ALS Support

Summary: 75+ Sites Worldwide

FURTHER INFORMATION

For further information on the SSC San Diego, Code D45, Integration and Interoperability Division, Data Link Test Tools products or capabilities, please contact:

Data Link Test Tools Web site at *http://gateway.nosc.mil*

E-mail: GWINFO@nosc.mil

Or call toll free: 1-888-GWLINKS

Reviewed and approved by

Executive Officer/
Base Operations Manager

SD 135
March 1999

Approved for public release; distribution is unlimited.

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